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D BULLETIN

A FLUSH-RIVET MILLING TOOL

By Robert Gottlieb
Langley Memorial Aeronautical Laboratory

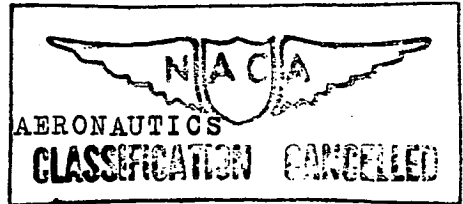
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June 1942



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STED BULLETIN

A FLUSH-RIVET MILLING TOOL

By Robert Gottlieb

The investigation of machine-countersunk flush rivets for aircraft described in reference 1 revealed the necessity of having the height of the rivet heads greater than the depth of the countersunk holes if tightly riveted joints were to be obtained. If ordinary roundhead rivets were inserted from the opposite side of the joint and the countersunk heads formed in the driving of the rivets filled the countersunk holes completely, still tighter joints were obtained. In either case the rivets protruded above the skin surface after driving, and the protruding portion of the rivet heads had to be removed in order to obtain flush rivets.

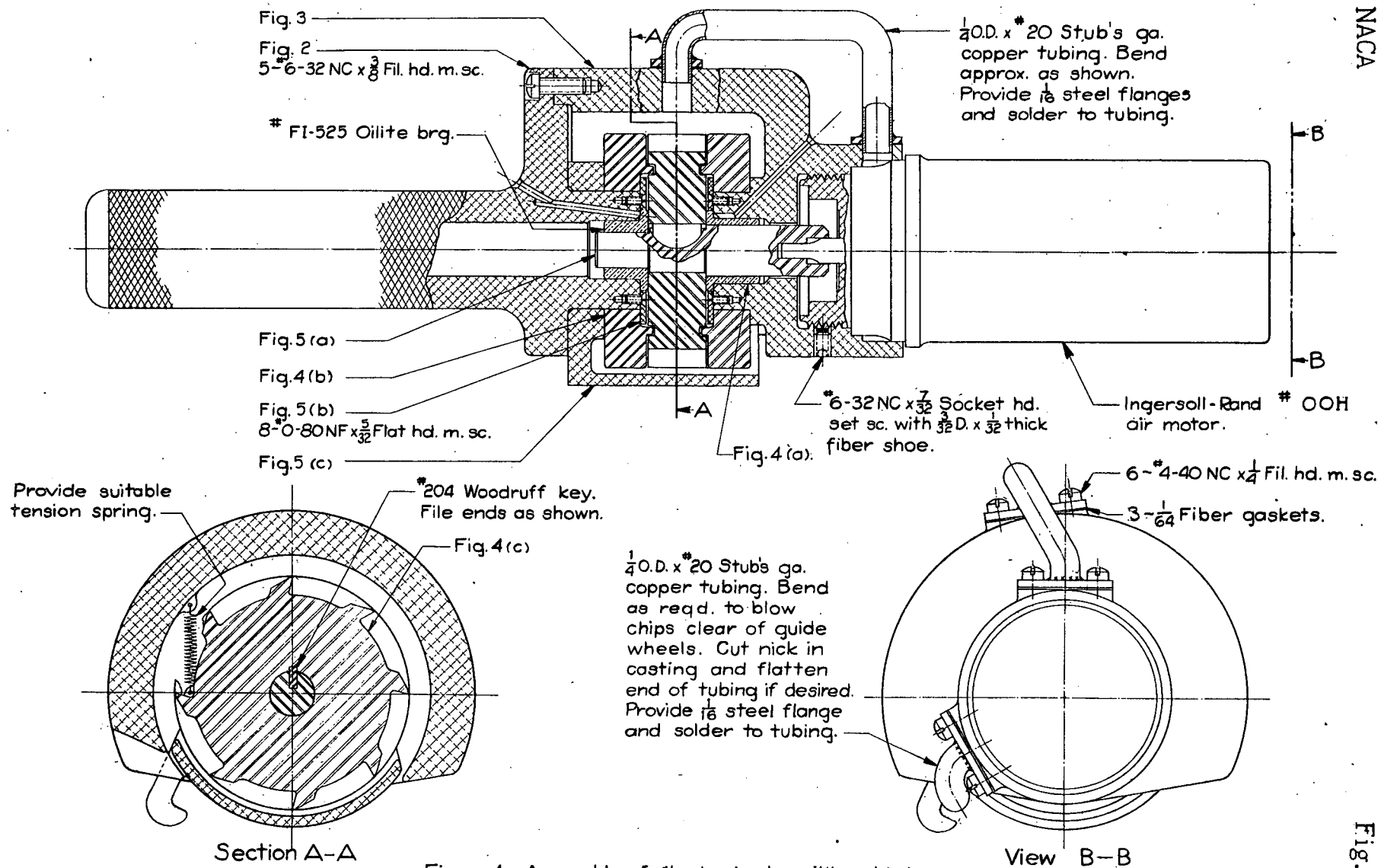
A number of requests have been received for a description of the tool used to mill off the protruding portion of the rivet heads. This report contains assembly and detail drawings (figs. 1 to 5) of the latest flush-rivet milling tool used at the NACA Structures Research Laboratory. Figure 6 shows the tool in operation.

This tool is quite satisfactory for 1/8-inch rivets, but a more powerful motor is recommended for use with larger rivets.

Langley Memorial Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va.

REFERENCE

1. Lundquist, Eugene E., and Gottlieb, Robert: A Study of the Tightness and Flushness of Machine-Countersunk Rivets for Aircraft. NACA R.B., June 1942.



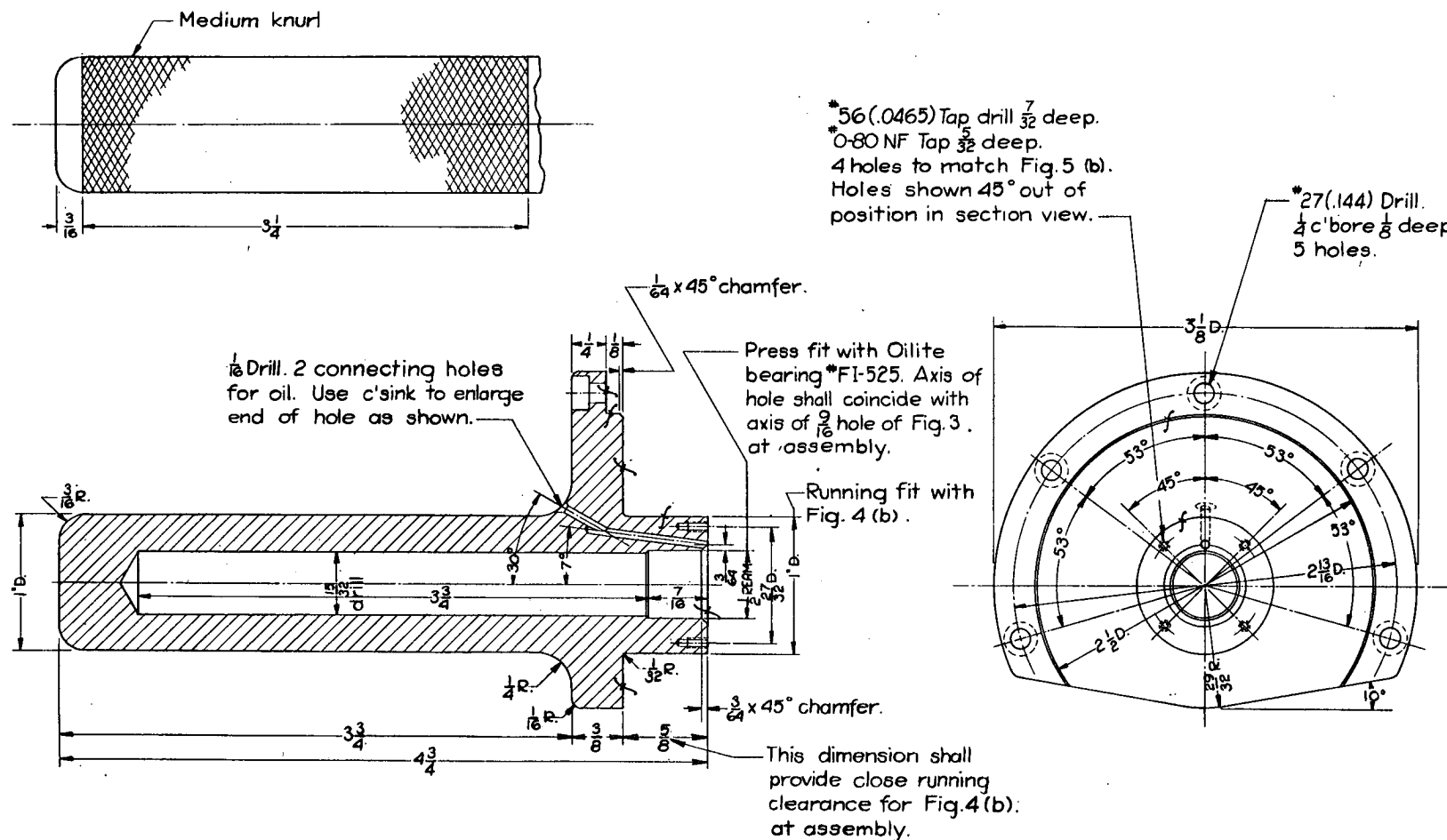
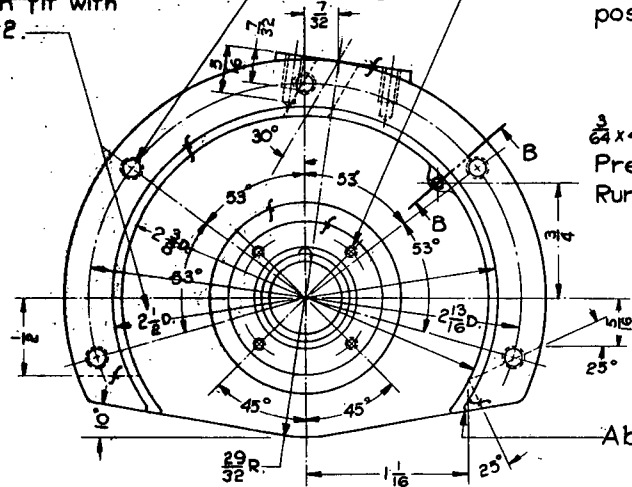


Figure 2. - Details of handle.

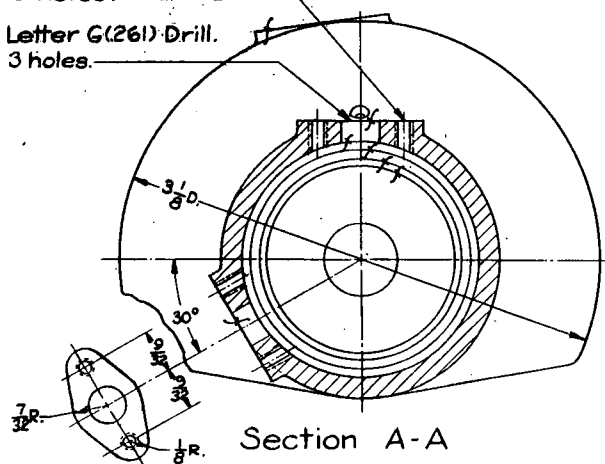
*36(.1065) Tap drill $\frac{7}{16}$ deep.
6-32 NC Tap $\frac{1}{8}$ deep.
5 holes to match Fig. 2.

Push fit with
Fig. 2.



*43(.089) Tap drill.
4-40 NC Tap.
6 holes.

Letter G(261) Drill.
3 holes.



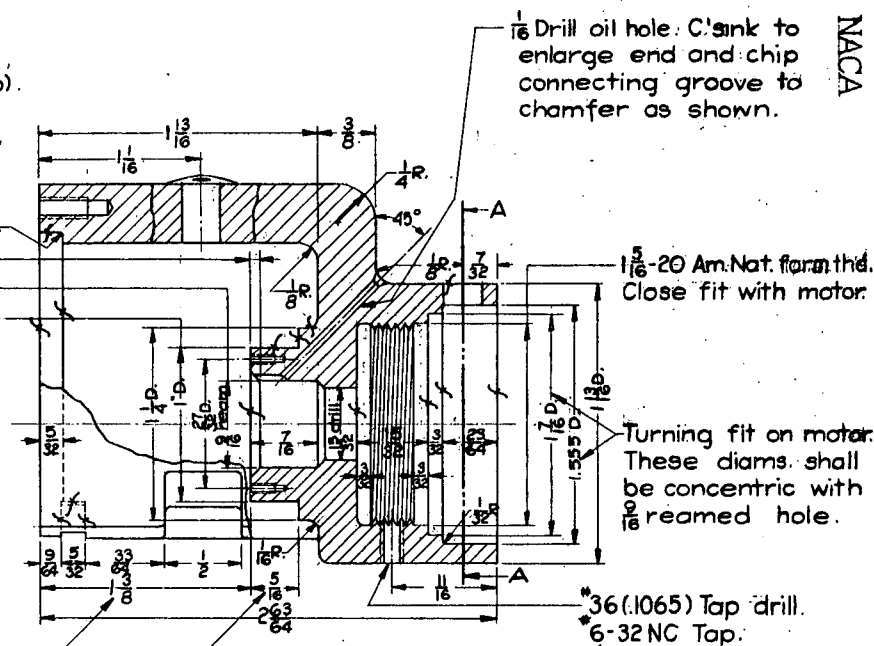
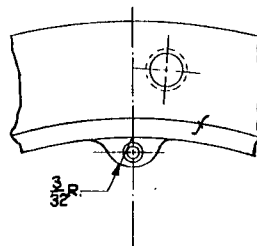
Section A-A

*56(.0465) Tap drill $\frac{7}{32}$ deep.
*0-80 NF Tap $\frac{5}{32}$ deep.
4 holes to match Fig. 5(b).
Holes shown 45° out of
position in section view.

$\frac{3}{64} \times 45^\circ$ chamfer
Press fit with Fig. 4 (a)
Running fit with Fig. 4 (b)

Abt. $\frac{1}{32} \times 45^\circ$ chamfer

This dimension shall
provide close running
clearance for Fig. 4(c)
at assembly.



$\frac{1}{16}$ Drill oil hole. C'sink to
enlarge end and chip
connecting groove to
chamfer as shown.

$\frac{1}{16}$ -20 Am. Nat. form thd.
Close fit with motor.

Turning fit on motor.
These diam. shall
be concentric with
 $\frac{1}{16}$ reamed hole.

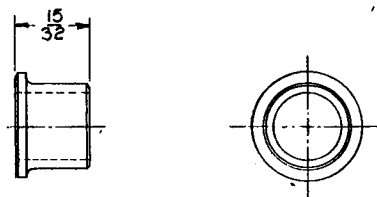
This dimension shall
provide close running
clearance for Fig. 4(b)
at assembly.

Drill to suit spring.
C'sink both ends
as shown.

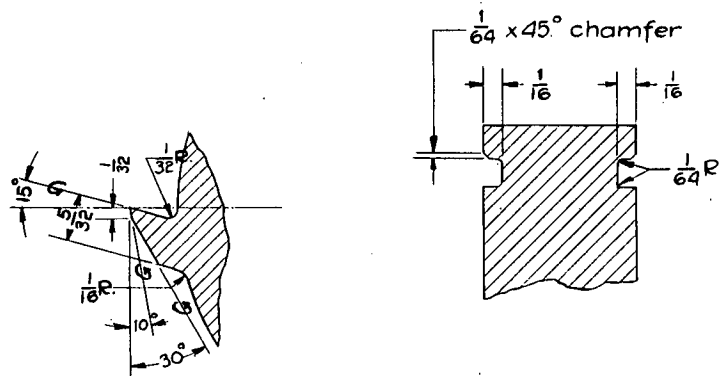
Section B-B

Cast aluminum alloy
1 reqd.

Figure 3. — Details of cutter housing.

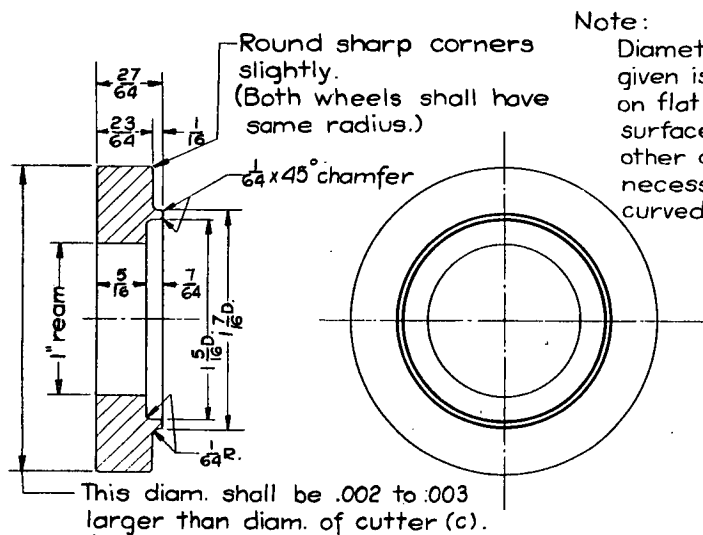


(a) Alteration to No.FI-504 Oilite bearing
1 reqd.



Section A-A

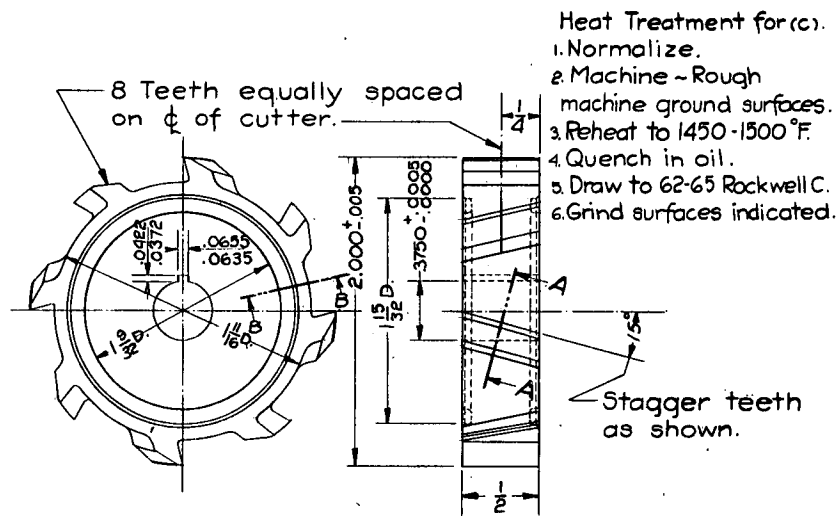
Section B-B



(b)
2 reqd.

Note:

Diameter of wheel as given is suitable for use on flat or single curved surfaces. Wheels of other diams. will be necessary on double curved surfaces.



(c)
1 reqd..

Cutter
Paragon steel (H.T.)

Figure 4. - Details of bearing, guide wheel, and cutter.

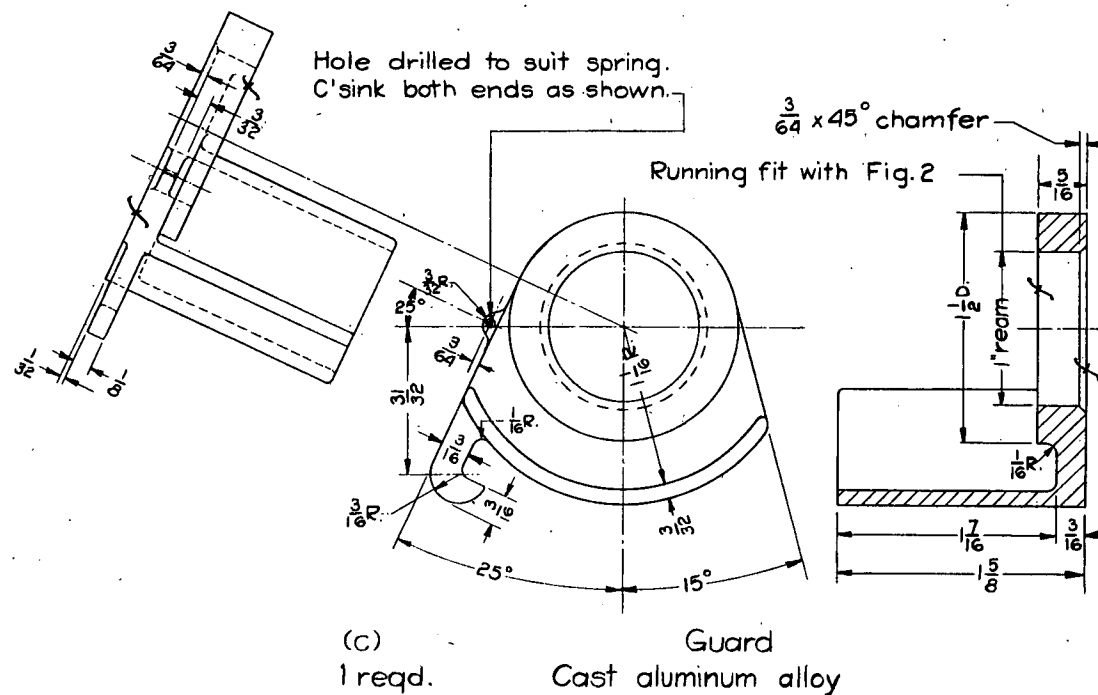
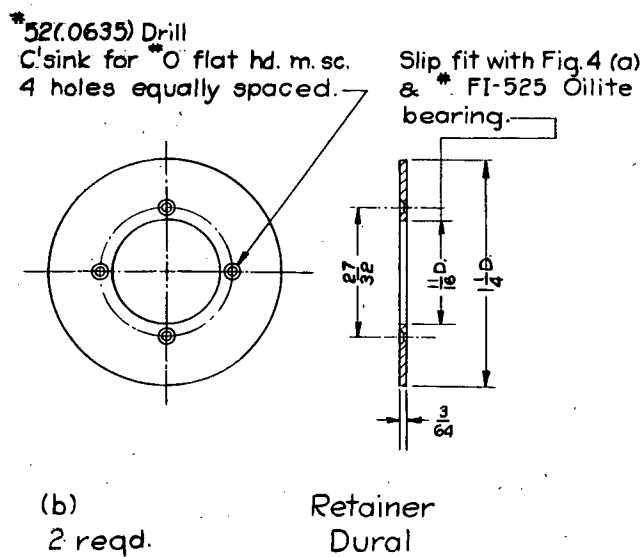
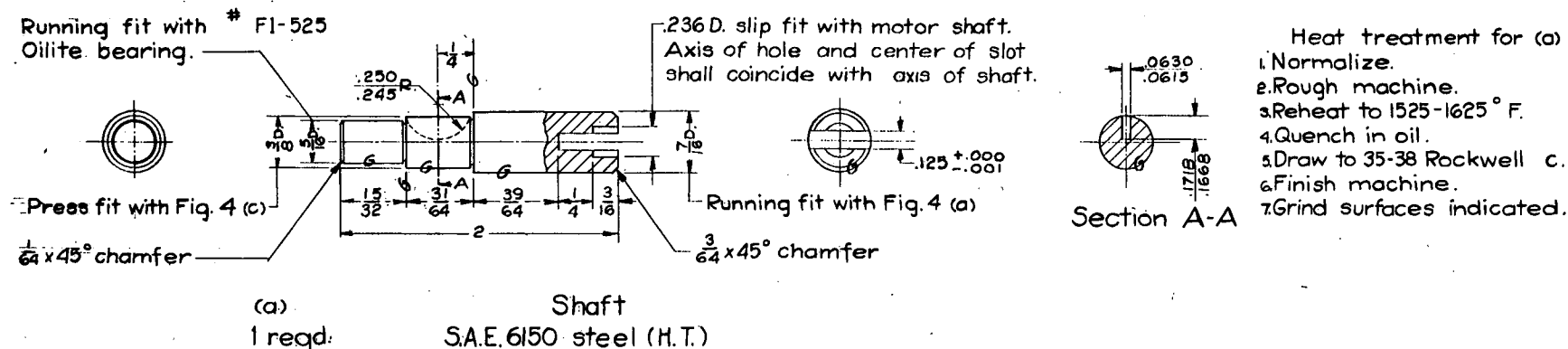


Figure 5. ~ Details of shaft, retainer, and guard.

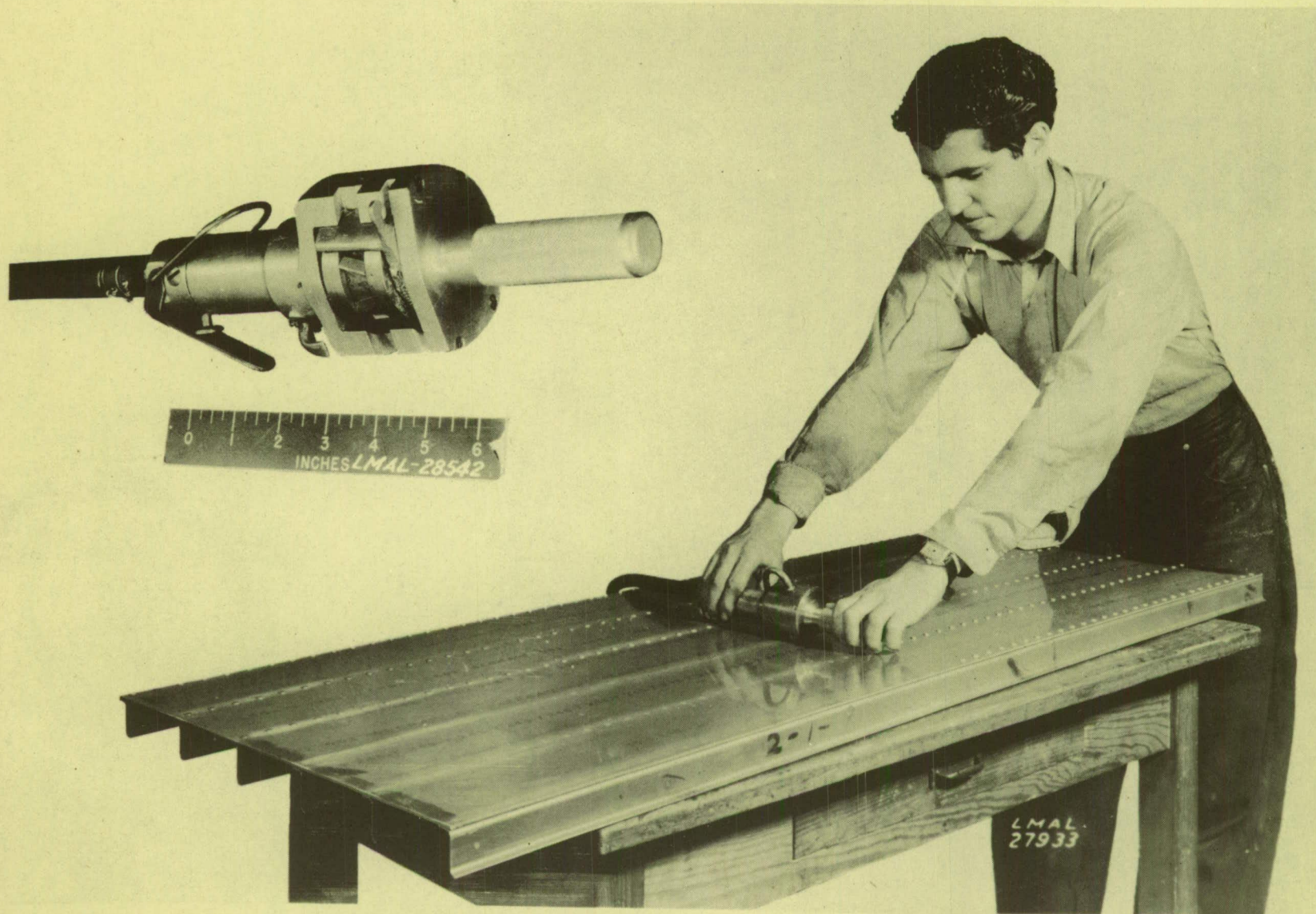


Figure 6.- Flush-rivet milling tool for removing the protruding portion of the rivet head.